NORTH DAKOTA DEPARTMENT of HEALTH

NDDOT North Dakota Department of Transportation

Compliance Productivity Profitability

Planning for success!

Alex Zimmerman CPESC

Real World Jobsite:

I-405 Case study of no active treatment but very effective BMP's

Washington State Department of Transportation

I-405 CORRIDOR
DESIGN-BUILDERS

An Integrated Transportation Solution

CH2MHILL Constructors, Inc.

GM

Safety ✓

Environmental Protection

- Habitat
  - Salmon
- Resources
  - Clean Water
- Goodwill
  - Public
  - Agency
  - Wildlife

Managing Risk

1. **Identify**
   Sources of Potential Harm
2. **Develop**
   Strategies to Manage Risk
3. **Implement**
   Plans to Reduce or Eliminate Risk

Thanks, Leo Holm

Only Three things we need to do:

1. Prevent Raindrop Erosion

- ✓Stop the rain from hitting bare soil.

2. Prevent Rill and Gully Erosion

- ✓Slow the water down.
- ✓Armor against the flow.

3. Good Housekeeping

- ✓Don’t make extra messes.
- ✓Clean up your messes.

"We know more about the movement of celestial bodies than about the soil underfoot."

-1452-1519
-Mathematician, Artist
-Inventor, Engineer

-The Last Supper
-Mona Lisa

-Leonardo Da Vinci

Kongiganak, AK

What next?

Task planning BMPs for Profit

Planning for Production

Planning for Compliance

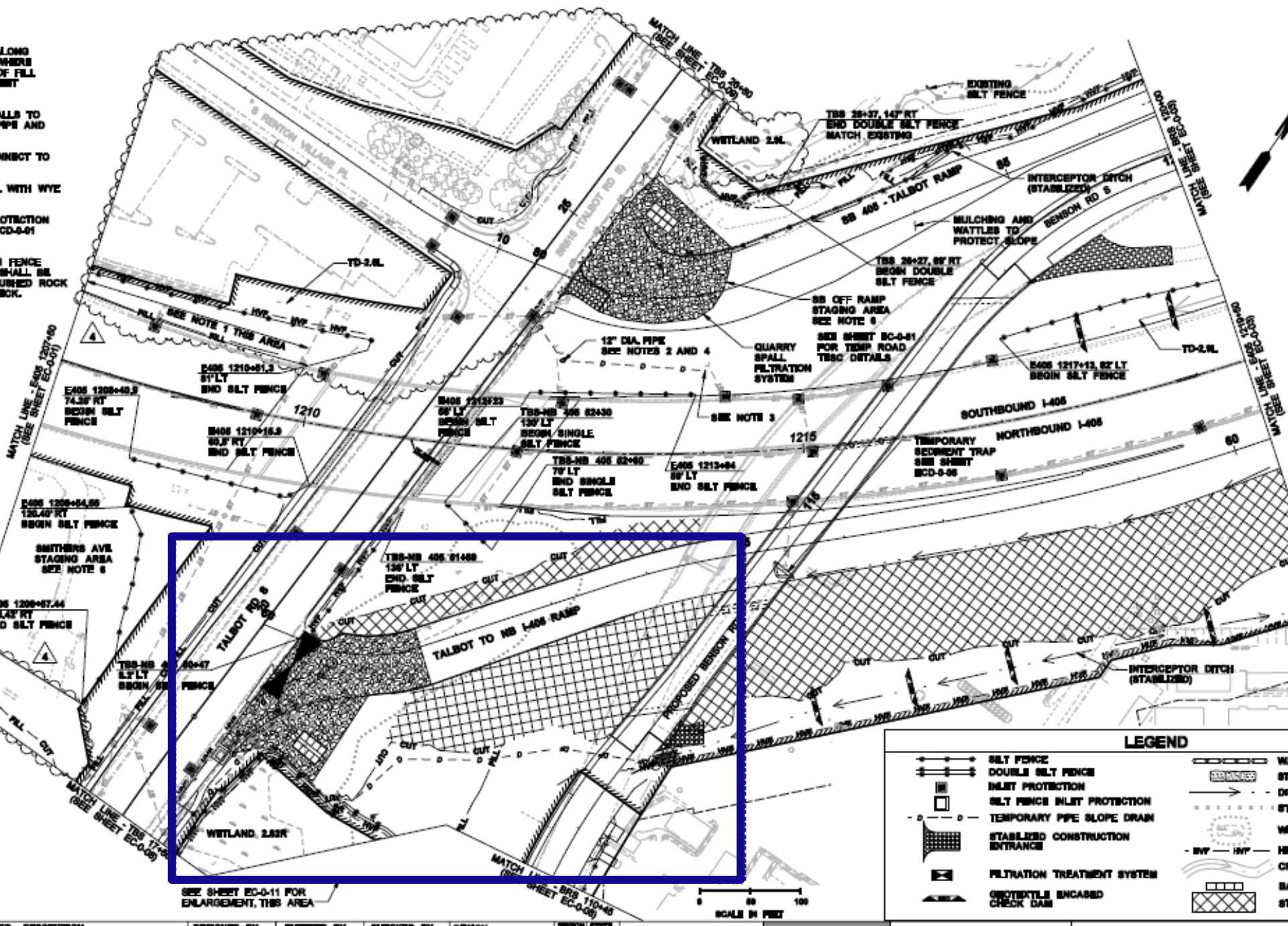
Managing Risk

✓ Documenting compliance

✓Clearing limits
✓Perimeter Controls
✓Discharges Points
✓Topsoil Salvage

Seeding
Plastic
Wattles
Silt Fence
Preserve Vegetation
RECP's
Channel Lining
What-Where-When?

Thinking
Differently

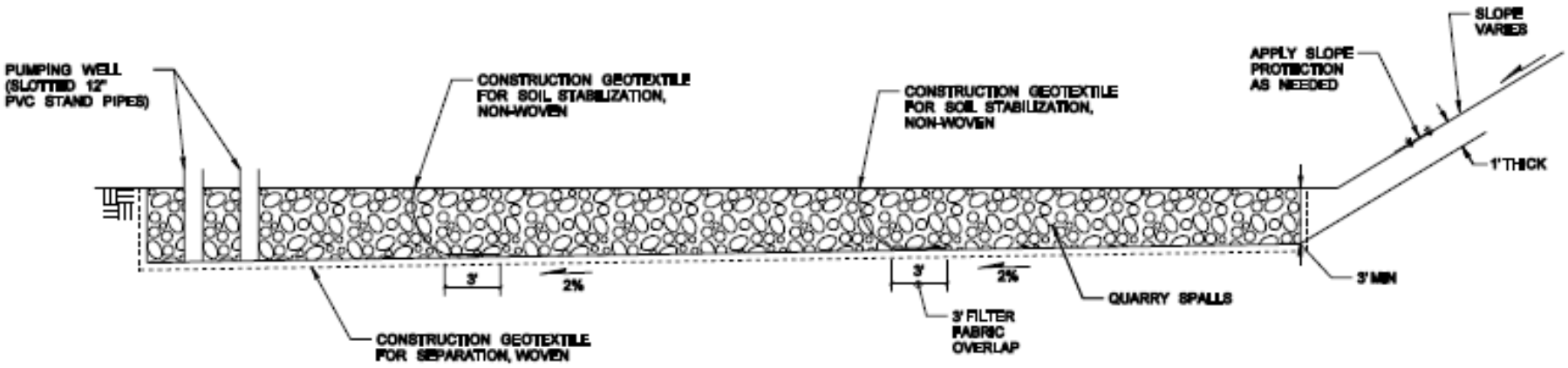


RD - DESCRIPTION	DESIGNED BY	ENTERED BY	CHECKED BY	DESIGN MANAGER	REVISION NO.	REVISION DATE
OR CONSTRUCTION - 2B	R. CHUNG	S. TAYLOR	R. ADAMS	J. BAUMAN	10	10/4/2
OR CONSTRUCTION - 2B	R. CHUNG	S. TAYLOR	S.CBRISTOPHERSON			
	R. CHUNG	S. TAYLOR	T. MCCARTHY			

I-405 CORRIDOR DESIGN-BUILDERS

I-405
I-5 TO SR 169

The “Environmental Bathtub”



QUARRY SPALL FILTRATION SYSTEM
TYPICAL CROSS-SECTION (NTS)

- 8oz Drainage Filter Fabric
- 2”-4” Spalls

Washington State Department of Transportation

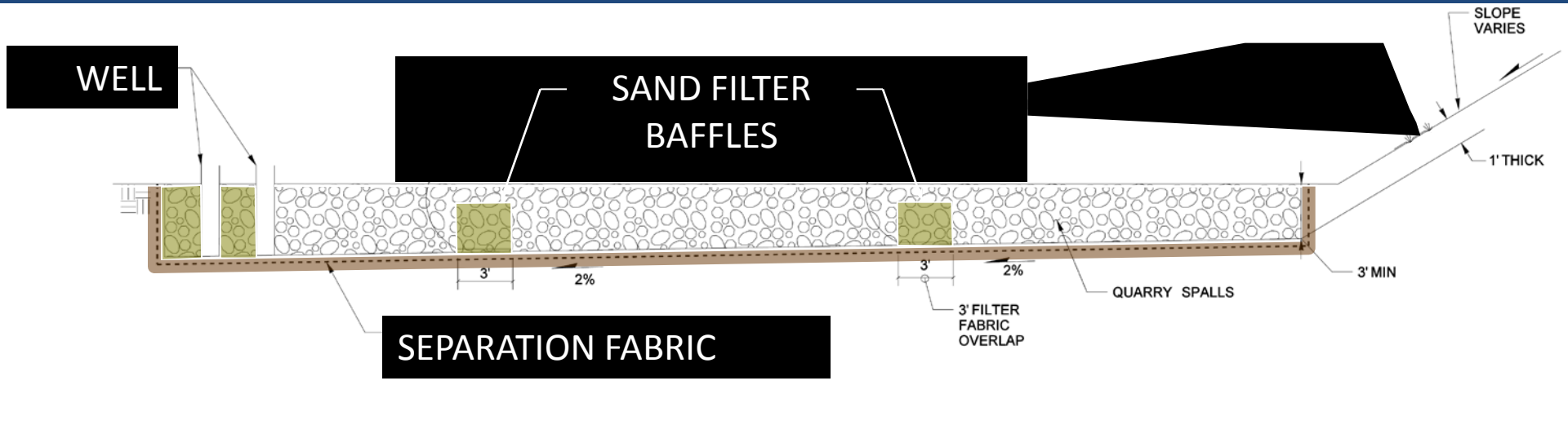
I-405 CORRIDOR DESIGN-BUILDERS
An Integrated Transportation Solution

HITACHI

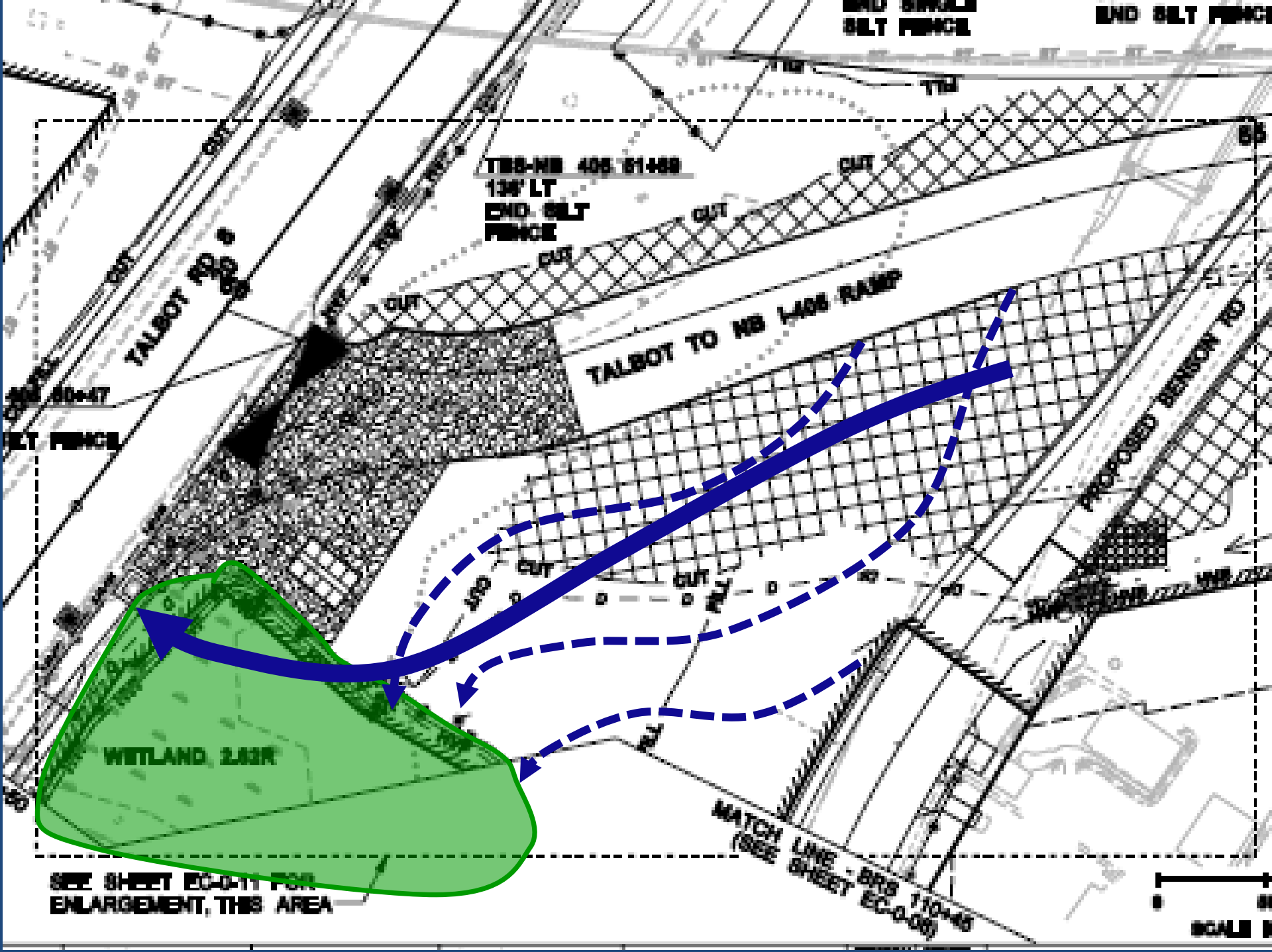
Washington State
Department of Transportation

CAT

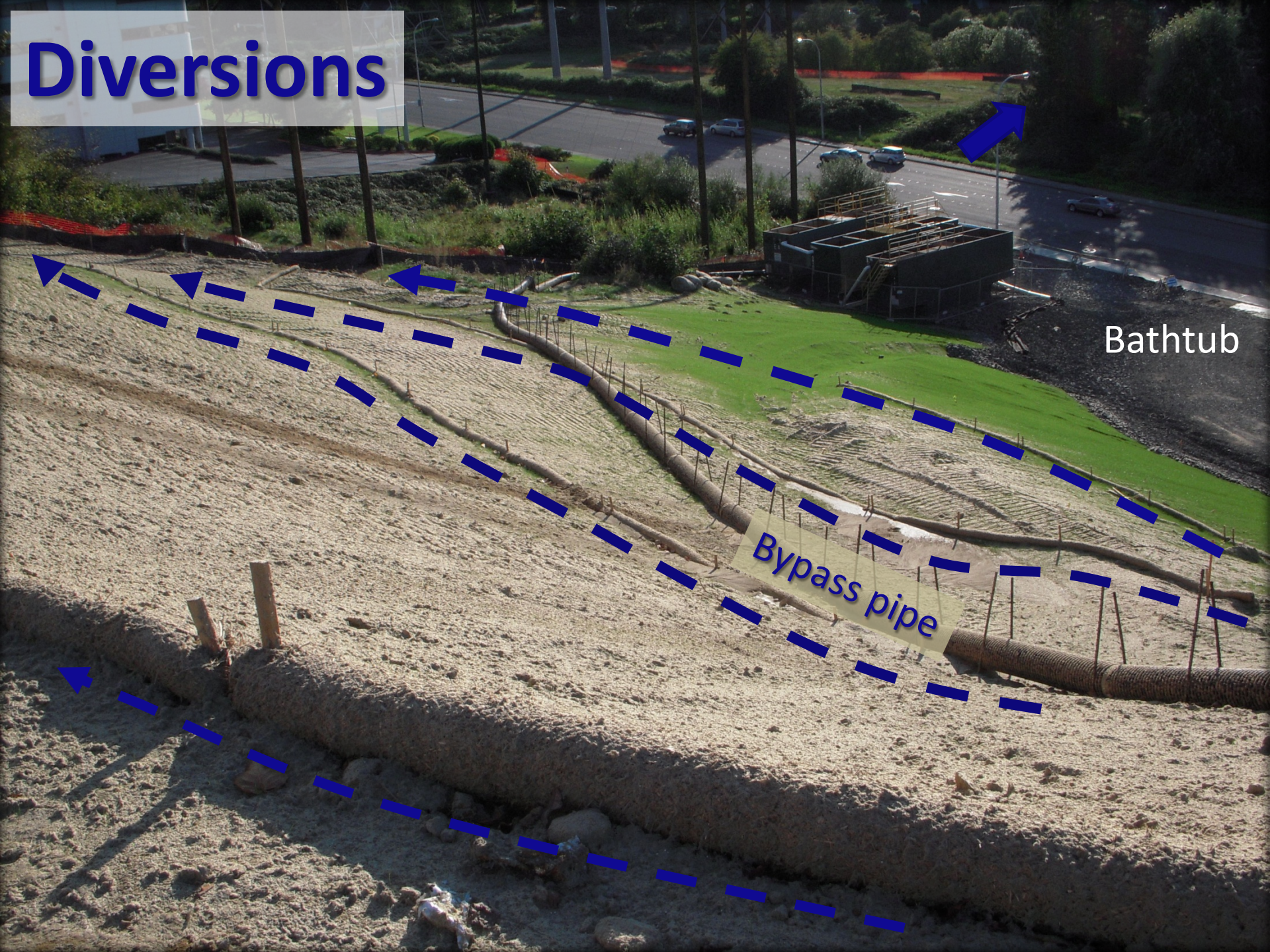
Any other risks?



IMPROVED
QUARRY SPALLS FILTRATION SYSTEM


END SILT FENCE
TBS-NB 405 81+69
136' LT
END SILT
FENCE
CUT
TALBOT RD
TALBOT TO NB I-405 RAMP
PROPOSED BENSON RD
WETLAND 2.63R
MATCH LINE - BRS 110+45
(SEE SHEET EC-0-05)
SEE SHEET EC-0-11 FOR
ENLARGEMENT, THIS AREA

Diversions



Sub Drainage

Maintenance Issues

Put Dirt Here
DEFINE YOUR TASKS

Place & Stabilize Dirt Here

Perspectives of Risk Management

- Agency
- Owner
- Contractor
- Sub Contractors
- Environmental Protection

Preserve vegetation
Even for a little while

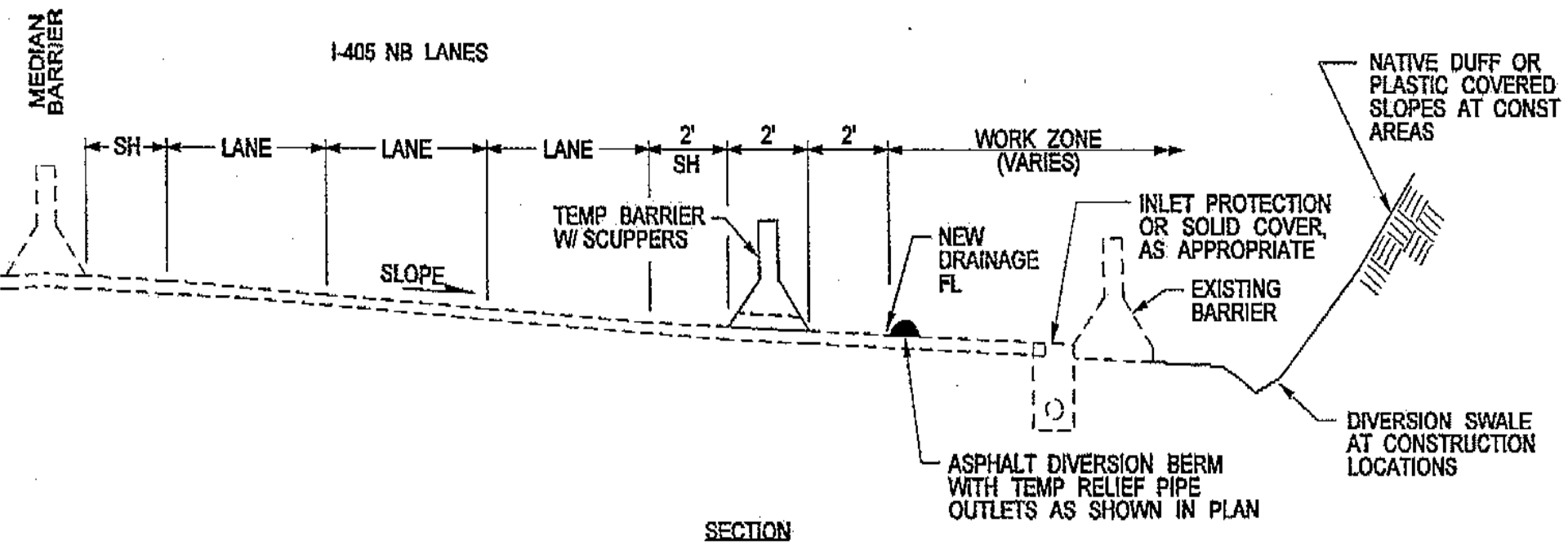
How will the flows change?

- Topography
- Compaction
- Stabilization Techniques

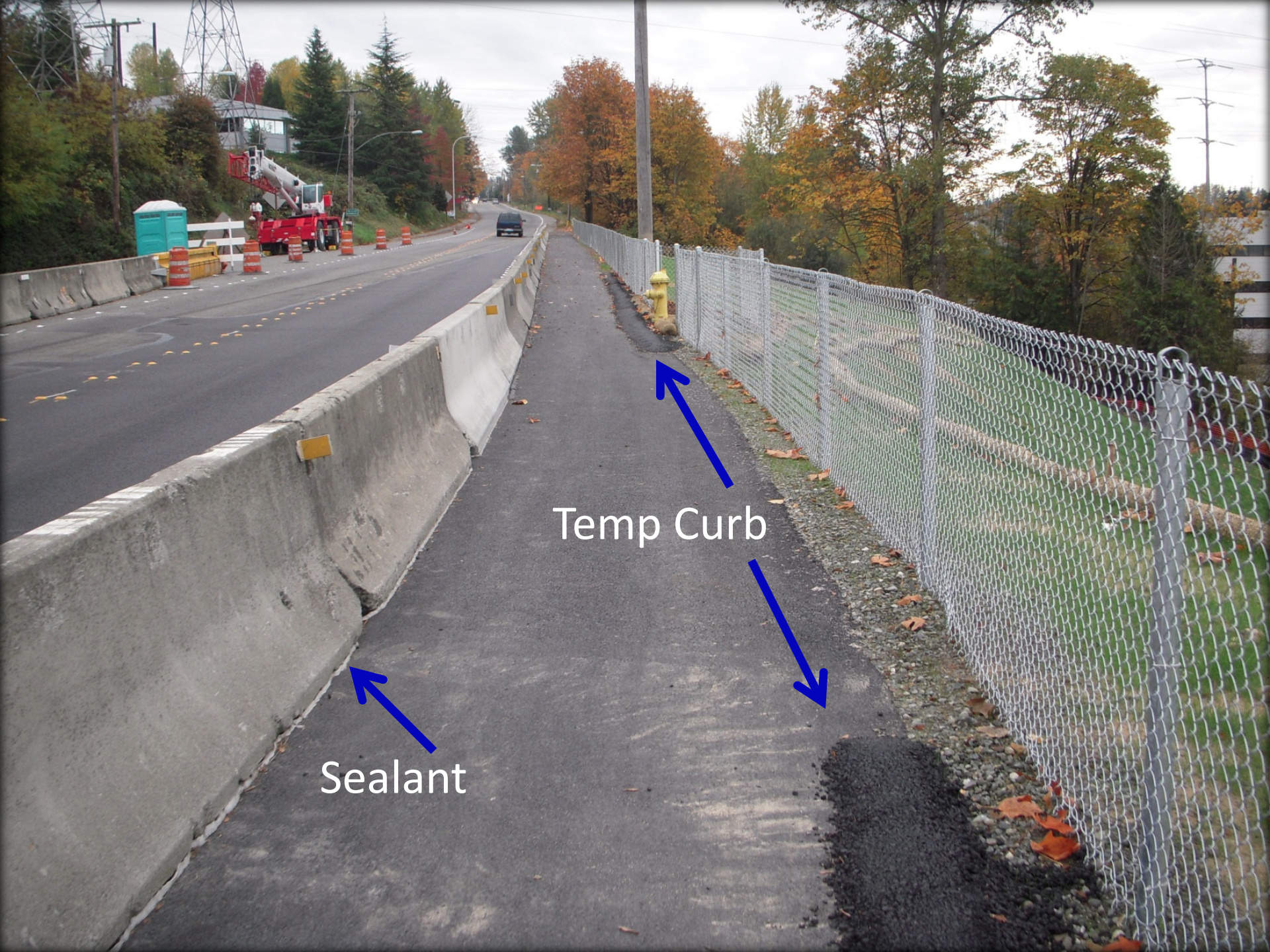
Temporary
Flow Management

Clean Water Bypass

Will this be enough?



- Will we need any calculations?
- What are the designed storm events?


Temp Curb
Sealant

Tired of
Maintenance?

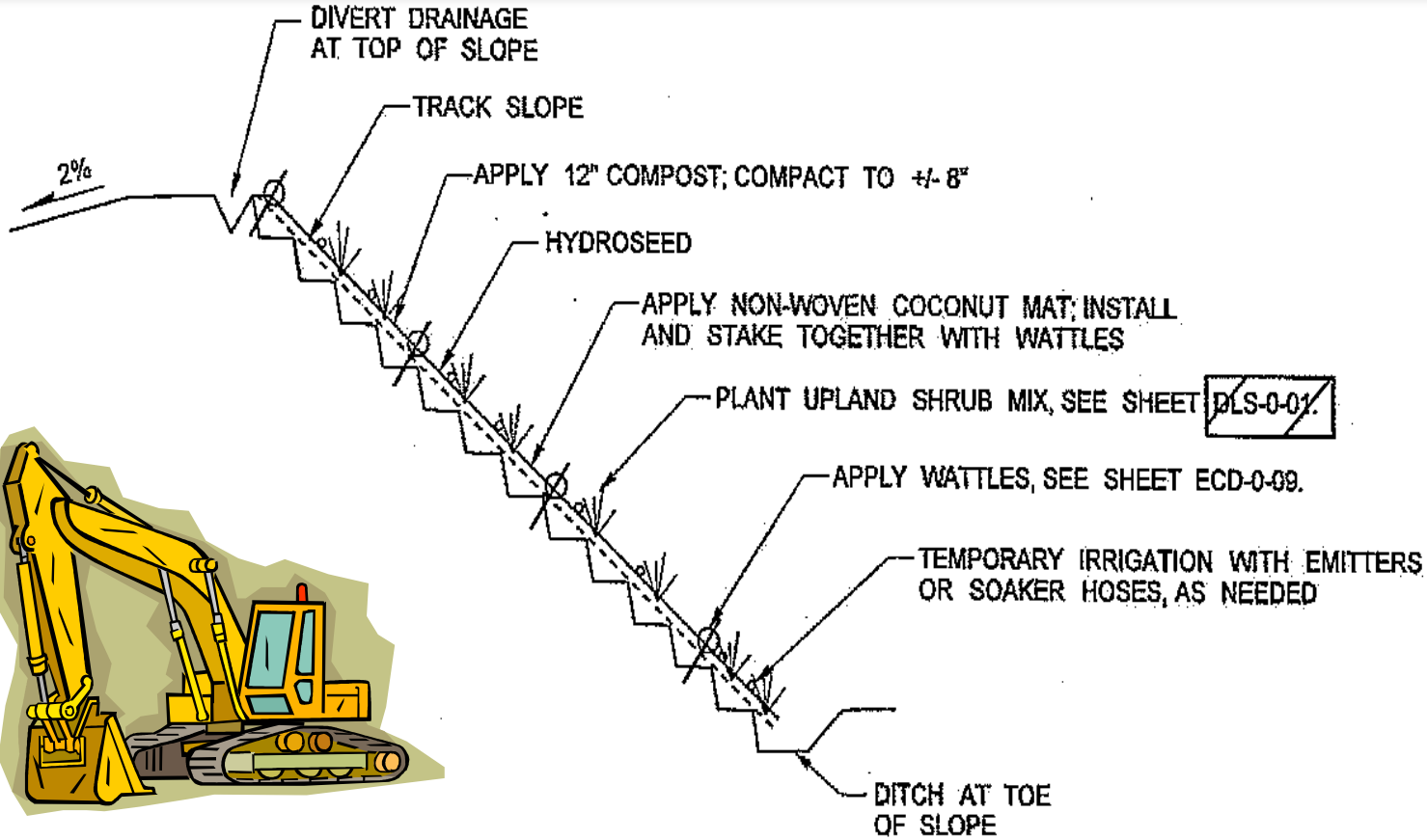
What's the next step?

Opportunities?

Liabilities ⇄ Assets

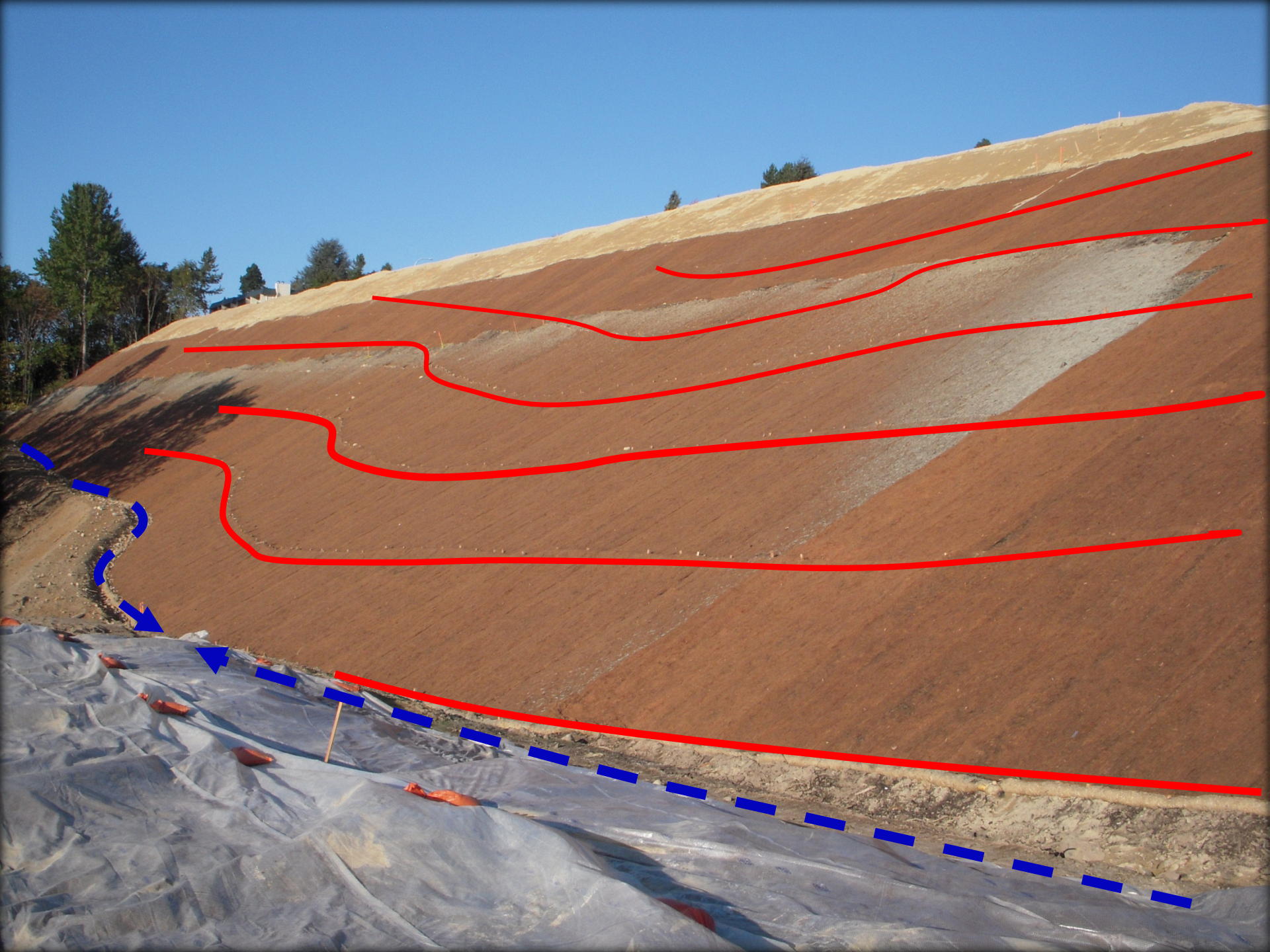
What Would You Do Next?

Design → Construction



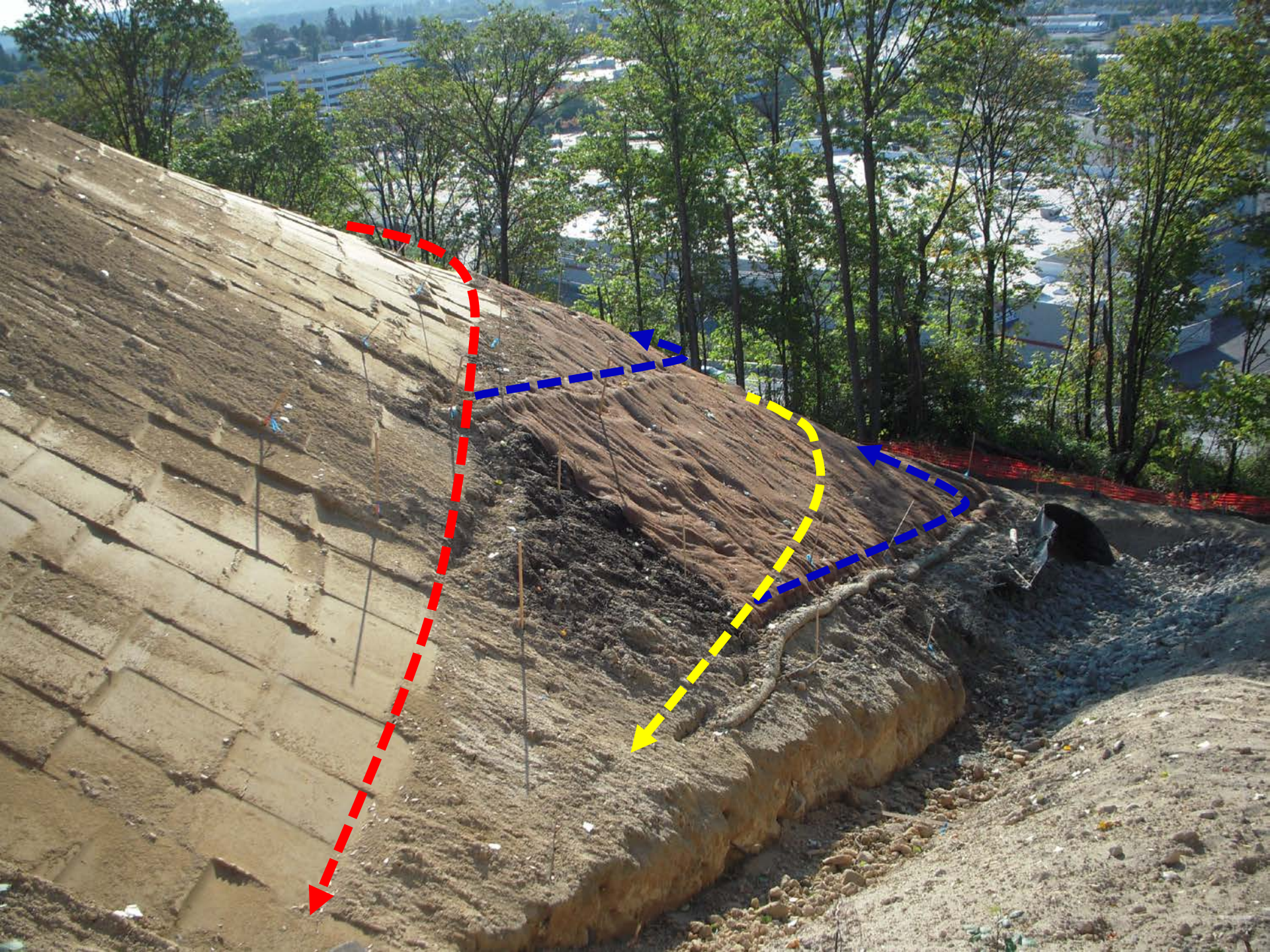
STEEP FILL SLOPE STABILIZATION

HITACHI

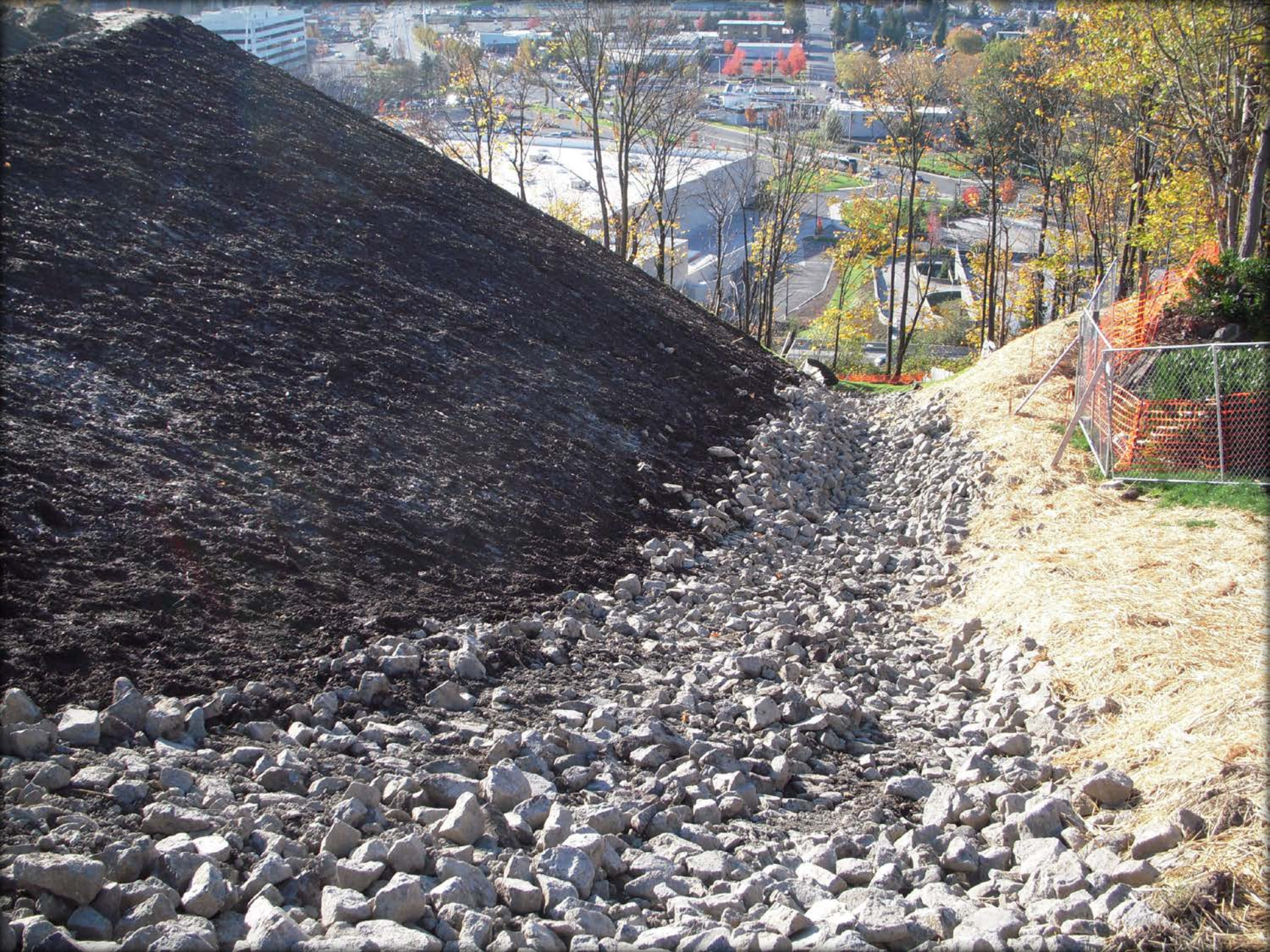


Opportunities?

Opportunities?



HITACHI



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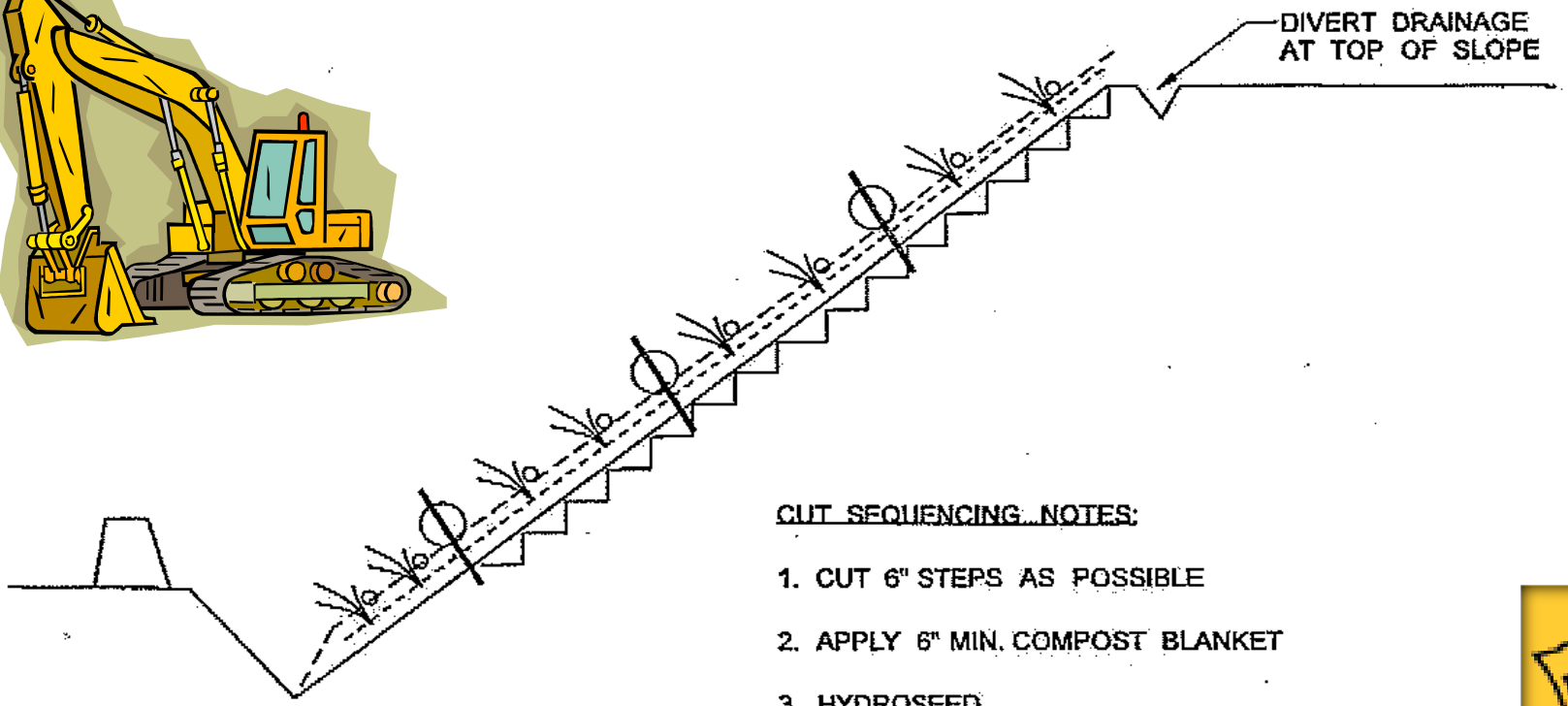

CUT SEQUENCING NOTES:

1. CUT 6" STEPS AS POSSIBLE
2. APPLY 6" MIN. COMPOST BLANKET
3. HYDROSEED
4. APPLY COIR MAT
5. PLANT UPLAND SHRUBS @ 5' O.C.
6. INSTALL WATTLES ACROSS SLOPE, PER WATTLE SPACING TABLE
7. INSTALL TEMPORARY IRRIGATION, AS NEEDED

STEEP CUT SLOPE STABILIZATION WITHOUT ROCK OUTCROP

(STA TBS-NB405 51+00 TO 55+00 RT)

CAT
CAT

MALCOLM

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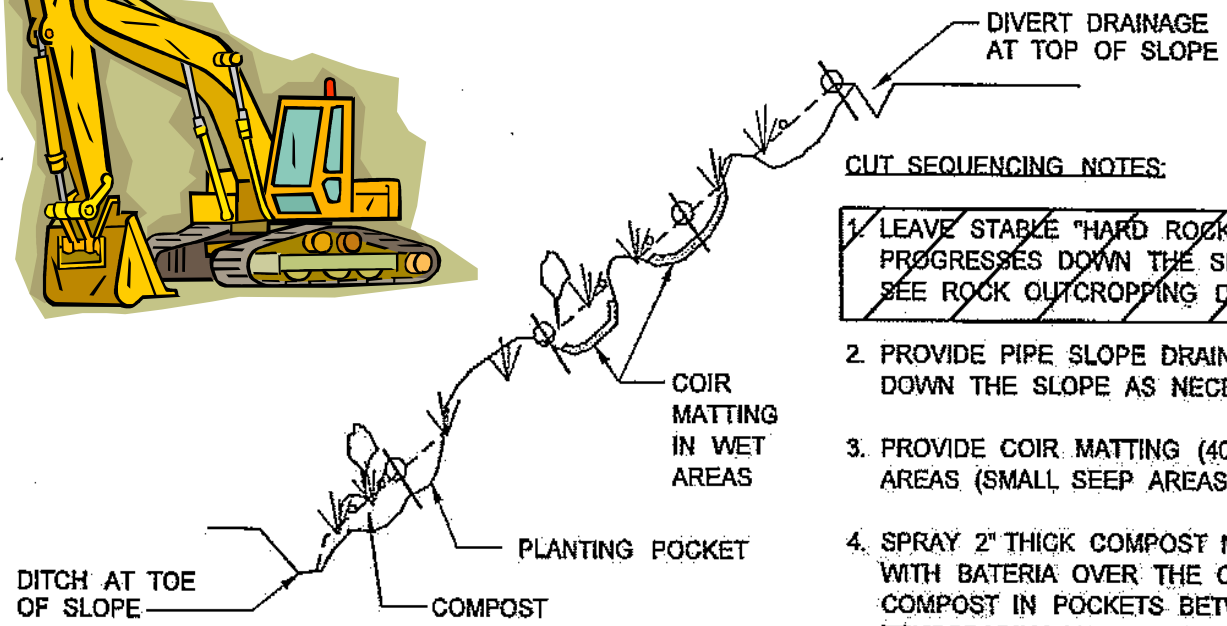
The Best Planning?

What gets installed?
How is it laid out?



CUT SEQUENCING NOTES:

1. LEAVE STABLE "HARD ROCK" OUTCROPPINGS IN PLACE AS GRADING PROGRESSES DOWN THE SLOPE TO INCREASE SURFACE ROUGHNESS. SEE ROCK OUTCROPPING DETAIL, SHEET DLS-0-XX.
2. PROVIDE PIPE SLOPE DRAINAGE TO CONVEY HIGH SEEPAGE FLOWS DOWN THE SLOPE AS NECESSARY. SEE PIPE SLOPE DRAIN DETAIL.
3. PROVIDE COIR MATTING (400 OR 700 GRAM) WITH FASTENERS IN WET AREAS (SMALL SEEP AREAS), OVER SANDSTONE SUBSOIL.
4. SPRAY 2" THICK COMPOST MIXED WITH HYDROSEED AND INOCULATED WITH BATERIA OVER THE COMPLETED SURFACE; PROVIDE 6" MIN THICK COMPOST IN POCKETS BETWEEN "HARD ROCK" OUTCROPPINGS. TEMPORARILY MULCH IN EXPOSED SOILS TO BE LEFT UNWORKED FOR MORE THAN 7 DAYS.
5. INSTALL STRAW WATTLES STRATEGICALLY TO MANAGE RUNOFF, AS FIELD DIRECTED (SLOPES STEEPER THAN 2H:1V). ARRANGE WATTLES SO THAT THEY DRAIN TO THE DITCH AT THE TOP OF SLOPE.
6. STAKE LIVE WILLOWS AT WET AREAS.

STEEP CUT SLOPE STABILIZATION WITH ROCK OUTCROP

(STA E405 1214+00 TO 1224+00 RT)

Risks - Opportunities

If Your not Nervous:
Your Nuts!

Maximum Extent Practicable?

- System Sizing
- Overflow Impacts
- Designed Flow Rates

CAT

Got Slopes?

Any Ideas?

Hurry, More,
Faster!

TREATED - UNTREATED

Any Less Nervous?

September

January

DEFINE YOUR TASKS

Container Plantings

Unique tasks & solutions

SPEED
LIMIT
Putzmeister 302-010
Putzmeister

VR-1044C
MOWAT
Ingersoll Rand
7004
7004

What should be of concern?

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"Since the achievement of our independence,
He is the greatest Patriot,
who stops the most gullies."

-1736 – 1799

-Introduced the Stamp Act

-1st post-colonial Governor of Virginia

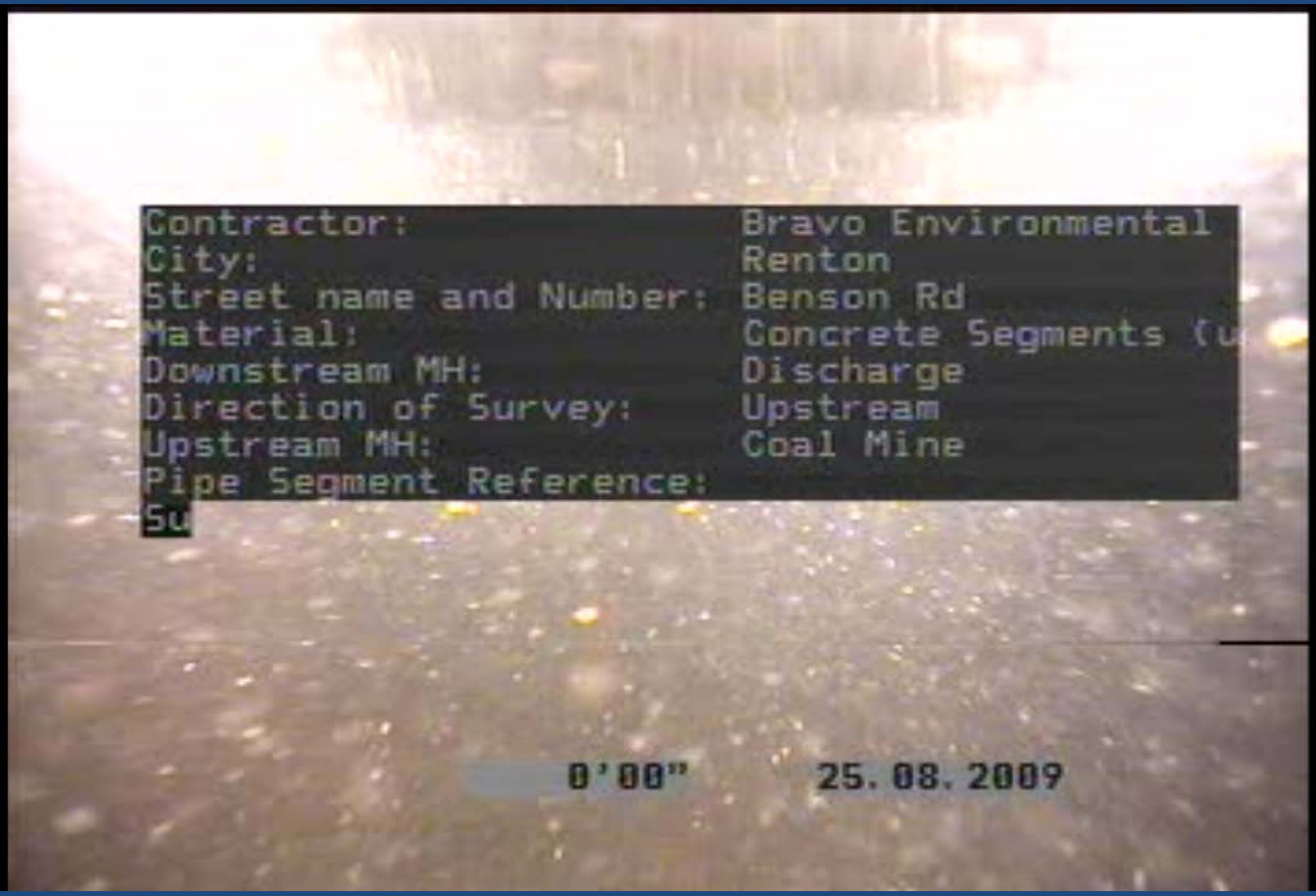
-Give me liberty or give me death

-Patrick Henry

CH2MHILL
Constructors, Inc.

GM

Alex Zimmerman CPESC
CISEC, CESSWI, CESCL, AK-CESCL
360-910-4800
alex@csigeo.com
Thanks
CAT
CAT


Contractor: Bravo Environmental
City: Renton
Street name and Number: Benson Rd
Material: Concrete Segments (u
Downstream MH: Discharge
Direction of Survey: Upstream
Upstream MH: Coal Mine
Pipe Segment Reference:
Su
0'00"
25.08.2009

SAM'S CLUB

TUNE 1520 AM
PROJECT INFO
10 14 2009

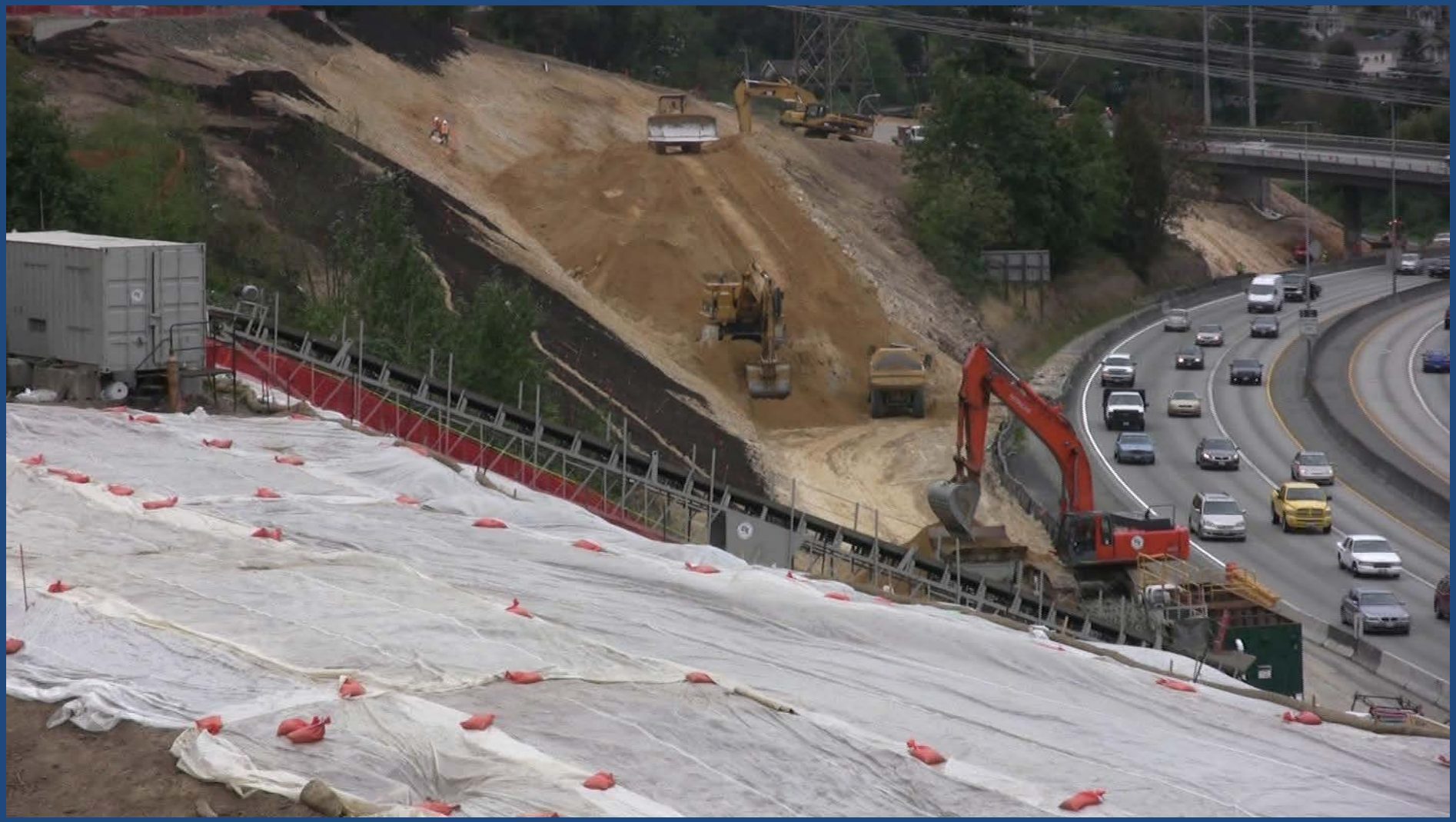
09.16
09.16.2009 16:20

10 . 14 . 2009

10 . 16 . 2009

3D Transport Inc.

✓ **Documenting compliance**



CATERPILLAR

CAUTION
STEEL PLATE
IN
ROADWAY